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EXAMINER	
FORMAN, BETTY J	
ART UNIT	**PAPER NUMBER**
1634	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	**Application No.** 09/735,402	**Applicant(s)** KURESHY, FAREED
	Examiner BJ Forman	**Art Unit** 1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5,6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Notice to Comply* .

DETAILED ACTION

Specification

1. The amendment filed 1 October 2001 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The amendments replace "colormetric" with "luminescent" throughout the specification. However, colormetric and luminescent have entirely different meanings in the art. Colormetric means visual, photoelectric or spectrophometric detection of color. In contrast, luminescent means light emitting and encompasses both fluorescence and phosphorescence (see Academic Press Dictionary of Science and Technology, 1992, pages 470 and 1281). Because colormetric and luminescent have entirely different meanings in the art, they are not interchangeable terms. Therefore, the amendments which replace "colormetric" with "luminescent" introduce new matter into the disclosure.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claims 1-17 are indefinite in Claim 1 for the recitation "thereby forming a stage for building a platform...biochip" because the recitation is a method step but the claim is drawn to

a product i.e. a stage. Therefore it is unclear whether Applicant is claiming a product by process. It is suggested that Claim 1 be amended to clarify e.g. delete the method step.

b. Claims 18-37 are indefinite in Claim 18 for the recitation "thereby forming a platform for building a biochip" because the recitation is a method step but the claim is drawn to a product i.e. a stage. Therefore it is unclear whether Applicant is claiming a product by process. It is suggested that Claim 18 be amended to clarify e.g. delete the method step.

c. Claims 38-55 are indefinite in Claim 38 for the recitation "thereby forming a biochip" because the recitation is a method step but the claim is drawn to a product i.e. a stage. Therefore it is unclear whether Applicant is claiming a product by process. It is suggested that Claim 38 be amended to clarify e.g. delete the method step.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 18-20, 26 and 38-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Ershov et al (U.S. Patent No. 5,770,721, issued 23 June 1998).

Regarding Claim 1, Ershov et al disclose a stage comprising: a carrier; and an aqueous matrix said carrier having a first side which is hydrophilic and optically inactive (i.e. the glass slide (stage) comprises aluminum which blocks emitted light (optically inactive) and treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface (i.e. polyacrylamide gel) disposed on said first side (Column 3, lines 17-21 and 40-51) thereby forming a stage for building a biochip. The courts have stated that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be

employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Because Ershov et al teach the structural limitations of the claimed stage, the intended use of the claims i.e. "for building a platform" and "for embedding cross-linking reagents...." does not differentiate the claimed stage from that of Ershov et al.

Regarding Claim 2, Ershov et al disclose the carrier is glass (Column 3, lines 40-45).

Regarding Claim 3, Ershov et al disclose the matrix comprises polyacrylamide (Column 3, lines 40-45).

Regarding Claim 18, Ershov et al disclose a platform comprising: a carrier having a first side which is hydrophilic and optically inactive (i.e. the glass slide (stage) comprises aluminum which is absorbing (optically inactive) and Gammainetacryloxy-propyltrimethoxysilane which is hydrophilic; an aqueous matrix (i.e. polyacrylamide gel) disposed on said first side (Column 3, lines 17-21 and 40-51); and cross-linking agents embedded in said matrix (i.e. hydrazine) thereby forming a platform for building a biochip.

Regarding Claim 19, Ershov et al disclose the carrier is glass (Column 3, lines 40-45).

Regarding Claim 20, Ershov et al disclose the matrix comprises polyacrylamide (Column 3, lines 40-45).

Regarding Claim 26, Ershov et al disclose the cross-linking agents comprise zero-length cross-linkers i.e. hydrazine (Column 5, lines 11-21).

Regarding Claim 38, Ershov et al disclose a biochip comprising: a carrier having a first side which is hydrophilic and optically inactive (i.e. the glass slide (stage) comprises aluminum which is absorbing (optically inactive) and Gammainetacryloxy-propyltrimethoxysilane which is hydrophilic; an aqueous matrix (i.e. polyacrylamide gel) disposed on said first side (Column 3, lines 17-21 and 40-51); cross-linking agents embedded in said matrix (i.e. hydrazine); and

sensing elements cross-linked to said cross-linking agents (Column 6, lines 3-5) thereby forming a platform for building a biochip.

Regarding Claim 39, Ershov et al disclose the cross-linking agents comprise zero-length cross-linkers i.e. hydrazine (Column 5, lines 11-21).

Regarding Claim 40, Ershov et al disclose the carrier is glass (Column 3, lines 40-45).

Regarding Claim 41, Ershov et al disclose the matrix comprises polyacrylamide (Column 3, lines 40-45).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-5, 8-13, 16-22, 25-32, 35-43, 46-51, 54 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havens et al (U.S. Patent No. 6,306,348 B1, filed 15 July 1999) in view of Ershov et al (U.S. Patent No. 5,770,721, issued 23 June 1998).

Regarding Claim 1, Havens et al teach a platform comprising: a carrier; and an aqueous matrix disposed on a first side of said carrier wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and functionally interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45) but they do not specifically teach the carrier is hydrophilic. However, Ershov et al teach a similar carrier comprising: a carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-

51). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the hydrophilic surface modification of Ershov et al to the carrier of Havens et al to thereby bind the matrix to the carrier and prevent movement of the matrix relative to the carrier. One skilled in the art would have been motivated to prevent movement of the matrix because the binding entities cross-linked to the matrix are identified by their position on the carrier (i.e. by the micro-location on the solid support, Havens et al, Column 4, lines 20-39) and any movement of the matrix relative to the carrier would result in mis-identification of the binding entities. Therefore, the skilled practitioner would have been motivated to bind the matrix to the carrier to thereby accurately identify the binding entities on the matrix.

Regarding Claim 2, Havens et al teach the carrier is selected from the group consisting of glass, silicon, plastic, ceramic and semiconductor materials (Column 4, lines 61-67).

Regarding Claim 3, Havens et al teach the matrix comprises one or more agents selected from the group consisting of agarose and gelatin (Column 8, line 46-Column 9, line 36).

Regarding Claim 4, Havens et al teach the matrix comprising buffers and surfactants (Column 8, lines 46-52).

Regarding Claim 5, Havens et al teach the matrix further comprises titanium (Column 3, lines 28-32).

Regarding Claim 8, Havens et al teach the matrix further comprises surfactants selected from the group consisting of ionic, non-ionic, zwitterionic and amphoteric surfactants (Column 9, lines 16-18).

Regarding Claim 9, Havens et al teach the matrix comprises two levels i.e. permeation and attachment layers (Column 8, lines 13-29).

Regarding Claim 10, Havens et al teach the carrier is selected from the group consisting of glass, silicon, plastic, ceramic and semiconductor materials (Column 4, lines 61-67).

Regarding Claim 11, Havens et al teach the stage wherein the levels comprise agarose (Column 9, lines 32-36).

Regarding Claim 12, Havens et al teach the stage wherein the levels comprise buffers and surfactants i.e. the matrix (Column 8, lines 47-52) and the agarose dissolved in buffer (Column 9, lines 32-36).

Regarding Claim 13, Havens et al teach the levels comprising light blocking agents i.e. titanium (Column 3, lines 28-31).

Regarding Claim 16, Havens et al teach the surfactant comprises one or more agents selected from the group consisting of ionic, non-ionic, zwitterionic and amphoteric surfactants (Column 9, lines 16-18).

Regarding Claim 17, Havens et al teach the matrix comprises cross-linking agents i.e. streptavidin (Column 9, lines 32-36).

Regarding Claim 18, Havens et al teach a platform comprising: a carrier; an aqueous matrix disposed on a first side of said carrier; and cross-linking agents (i.e. streptavidin) wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and functionally interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45 and Column 9, lines 32-36) but they do not specifically teach the carrier is hydrophilic. However, Ershov et al teach a similar carrier comprising: a carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-51). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the hydrophilic surface modification of Ershov et al to the carrier of Havens et al to

thereby bind the matrix to the carrier and prevent movement of the matrix relative to the carrier. One skilled in the art would have been motivated to prevent movement of the matrix because the binding entities cross-linked to the matrix are identified by their position on the carrier (i.e. by the micro-location on the solid support, Havens et al, Column 4, lines 20-39) and any movement of the matrix relative to the carrier would result in mis-identification of the binding entities. Therefore, the skilled practitioner would have been motivated to bind the matrix to the carrier to thereby accurately identify the binding entities on the matrix.

Regarding Claim 19, Havens et al teach the carrier is selected from the group consisting of glass, silicon, plastic, ceramic and semiconductor materials (Column 4, lines 61-67).

Regarding Claim 20, Havens et al teach the matrix comprises one or more agents selected from the group consisting of agarose and gelatin (Column 8, line 46-Column 9, line 36).

Regarding Claim 21, Havens et al teach the matrix comprising buffers and surfactants (Column 8, lines 46-52).

Regarding Claim 22, Havens et al teach the matrix further comprises titanium (Column 3, lines 28-32).

Regarding Claim 25, Havens et al teach the matrix further comprises surfactants selected from the group consisting of ionic, non-ionic, zwitterionic and amphoteric surfactants (Column 9, lines 16-18).

Regarding Claim 26, Havens et al teach the cross-linking agents are selected from the group consisting of homobifunctional linkers and zero-length cross-linkers i.e. streptavidin and aminopropyltrimethoxysilane (Column 9, lines 32-58).

Regarding Claim 27, Havens et al teach the platform further comprising sensing elements e.g. oligonucleotides (Column 9, lines 32-58).

Regarding Claim 28, Havens et al teach the matrix comprises two levels i.e. permeation and attachment layers (Column 8, lines 13-29 and Fig. 9).

Regarding Claim 29, Havens et al teach the carrier is selected from the group consisting of glass, silicon, plastic, ceramic and semiconductor materials (Column 4, lines 61-67).

Regarding Claim 30, Havens et al teach the platform wherein the levels comprise agarose (Column 9, lines 32-36).

Regarding Claim 31, Havens et al teach the platform wherein the levels comprise buffers and surfactants i.e. the matrix (Column 8, lines 47-52) and the agarose dissolved in buffer (Column 9, lines 32-36).

Regarding Claim 32, Havens et al teach the levels comprising light blocking agents i.e. titanium (Column 3, lines 28-31).

Regarding Claim 35, Havens et al teach the matrix further comprises surfactants selected from the group consisting of ionic, non-ionic, zwitterionic and amphoteric surfactants (Column 9, lines 16-18).

Regarding Claim 36, Havens et al teach the platform wherein said matrix comprises cross-linking agents selected from the group consisting of homobifunctional linkers and zero-length cross-linkers i.e. streptavidin and aminopropyltrimethoxysilane (Column 9, lines 32-58).

Regarding Claim 37, Havens et al teach the platform further comprising sensing elements linked to the top surface of said matrix e.g. oligonucleotides (Column 9, lines 32-58).

Regarding Claim 38, Havens et al teach a biochip comprising a platform comprising: a carrier; an aqueous matrix disposed on a first side of said carrier; cross-linking agents (i.e. streptavidin); and sensing elements cross-linked to said cross-linking agents in said matrix wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and functionally interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45

and Column 9, lines 32-55) but they do not specifically teach the carrier is hydrophilic. However, Ershov et al teach a similar carrier comprising: a carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-51). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the hydrophilic surface modification of Ershov et al to the carrier of Havens et al to thereby bind the matrix to the carrier and prevent movement of the matrix relative to the carrier. One skilled in the art would have been motivated to prevent movement of the matrix because the binding entities cross-linked to the matrix are identified by their position on the carrier (i.e. by the micro-location on the solid support, Havens et al, Column 4, lines 20-39) and any movement of the matrix relative to the carrier would result in mis-identification of the binding entities. Therefore, the skilled practitioner would have been motivated to bind the matrix to the carrier to thereby accurately identify the binding entities on the matrix.

Regarding Claim 39, Havens et al teach the biochip wherein said cross-linking agents selected from the group consisting of homobifunctional linkers and zero-length cross-linkers i.e. streptavidin and aminopropyltrimethoxysilane (Column 9, lines 32-58).

Regarding Claim 40, Havens et al teach the carrier is selected from the group consisting of glass, silicon, plastic, ceramic and semiconductor materials (Column 4, lines 61-67).

Regarding Claim 41, Havens et al teach the matrix comprises one or more agents selected from the group consisting of agarose and gelatin (Column 8, line 46-Column 9, line 36).

Regarding Claim 42, Havens et al teach the matrix comprising buffers and surfactants (Column 8, lines 46-52).

Regarding Claim 43, Havens et al teach the matrix further comprises titanium (Column 3, lines 28-32).

Regarding Claim 46, Havens et al teach the matrix further comprises surfactants selected from the group consisting of ionic, non-ionic, zwitterionic and amphoteric surfactants (Column 9, lines 16-18).

Regarding Claim 47, Havens et al teach the biochip wherein said matrix comprises two levels i.e. permeation and attachment layers (Column 8, lines 13-29 and Fig. 9).

Regarding Claim 48, Havens et al teach the carrier is selected from the group consisting of glass, silicon, plastic, ceramic and semiconductor materials (Column 4, lines 61-67).

Regarding Claim 49, Havens et al teach the biochip wherein the levels comprise agarose (Column 9, lines 32-36).

Regarding Claim 50, Havens et al teach the biochip wherein the levels comprise buffers and surfactants i.e. the matrix (Column 8, lines 47-52) and the agarose dissolved in buffer (Column 9, lines 32-36).

Regarding Claim 51, Havens et al teach the levels comprising light blocking agents i.e. titanium (Column 3, lines 28-31).

Regarding Claim 54, Havens et al teach the biochip wherein the surfactants comprises one or more agents selected from the group consisting of ionic, non-ionic, zwitterionic and amphoteric surfactants (Column 9, lines 16-18).

Regarding Claim 55, Havens et al teach the biochip wherein the cross-linking agents are selected from the group consisting of homobifunctional linkers and zero-length cross-linkers i.e. streptavidin and aminopropyltrimethoxysilane (Column 9, lines 32-58).

8. Claims 6, 7, 14, 15, 23, 24, 33, 34, 44, 45, 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havens et al (U.S. Patent No. 6,306,348 B1, filed 15 July 1999) in view of Ershov et al (U.S. Patent No. 5,770,721, issued 23 June 1998) as applied to Claims 1, 18 and 38 above and further in view of Chetverin et al (U.S. Patent No. 6,001,568, issued 14 December 1999).

Regarding Claims 6 and 14, Havens et al teach a platform comprising: a carrier; and an aqueous matrix comprising one or more levels disposed on a first side of said carrier wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and functionally interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45). Ershov et al teach a similar platform comprising: a carrier and a matrix, said carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-51). Havens et al and Ershov et al teach the aqueous matrix comprises agarose (Havens et al, Column 9, lines 32-36 and Ershov et al, Column 3, lines 40-45) but they do not teach the matrix comprises a specific buffer. However, it was known in the art at the time the claimed invention was made that agarose comprises buffers as taught by Chetverin et al who teach a similar platform comprising a carrier and aqueous matrix wherein the agarose matrix comprises TRIS (Column 16, lines 32-39). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the TRIS buffered agarose as taught by Chetverin et al to the agarose of Havens et al and Ershov et al based on the known buffering properties of TRIS for the obvious benefit of maintaining optimal pH in the agarose to thereby optimize binding reactions between the cross-linked elements and their binding partners.

Regarding Claim 7 and 15, Havens et al teach a platform comprising: a carrier; and an aqueous matrix comprising one or more levels disposed on a first side of said carrier wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and

functionally interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45). Ershov et al teach a similar platform comprising: a carrier and a matrix, said carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-51). Havens et al and Ershov et al teach the aqueous matrix comprises agarose (Havens et al, Column 9, lines 32-36 and Ershov et al, Column 3, lines 40-45) but they do not teach the matrix comprises humectants. However, it was known in the art at the time the claimed invention was made that matrix comprise humectants as taught by Chetverin et al who teach a similar platform comprising a carrier and aqueous matrix wherein the matrix comprises oil (Column 8, lines 39-45) whereby the oil prevents drying of the aqueous matrix. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the oiled matrix taught by Chetverin et al to the aqueous matrix of Havens et al and Ershov et al to thereby prevent drying of the aqueous matrix for the expected benefit of maintaining the aqueous environment and preventing inactivation of binding reactants as taught by Chetverin et al (Column 8, lines 39-45).

Regarding Claims 23 and 33, Havens et al teach a platform comprising: a carrier; an aqueous matrix comprising one or more levels disposed on a first side of said carrier; and cross-linking agents, wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and functionally interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45). Ershov et al teach a similar platform comprising: a carrier, a matrix and cross-linking agents, said carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-51). Havens et al and Ershov et al teach the aqueous matrix comprises agarose (Havens et al, Column 9, lines 32-36 and Ershov et al,

Column 3, lines 40-45) but they do not teach the matrix comprises a specific buffer. However, it was known in the art at the time the claimed invention was made that agarose comprises buffers as taught by Chetverin et al who teach a similar platform comprising a carrier and aqueous matrix wherein the agarose matrix comprises TRIS (Column 16, lines 32-39). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the TRIS buffered agarose as taught by Chetverin et al to the agarose of Havens et al and Ershov et al based on the known buffering properties of TRIS for the obvious benefit of maintaining optimal pH in the agarose to thereby optimize binding reactions between the cross-linked elements and their binding partners.

Regarding Claims 24 and 34, Havens et al teach a platform comprising: a carrier; an aqueous matrix comprising one or more levels disposed on a first side of said carrier; and cross-linking agents, wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and functionally interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45). Ershov et al teach a similar platform comprising: a carrier, a matrix and cross-linking agents, said carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-51). Havens et al and Ershov et al teach the aqueous matrix comprises agarose (Havens et al, Column 9, lines 32-36 and Ershov et al, Column 3, lines 40-45) but they do not teach the matrix comprises humectant. However, it was known in the art at the time the claimed invention was made that matrix comprise humectants as taught by Chetverin et al who teach a similar platform comprising a carrier and aqueous matrix wherein the matrix comprises oil (Column 8, lines 39-45) whereby the oil prevents drying of the aqueous matrix. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the oiled matrix taught by Chetverin et al to the aqueous matrix of Havens et al and Ershov et al to thereby prevent drying of the aqueous

matrix for the expected benefit of maintaining the aqueous environment and preventing inactivation of binding reactants as taught by Chetverin et al (Column 8, lines 39-45).

Regarding Claims 44 and 52, Havens et al teach a platform comprising: a carrier; an aqueous matrix comprising one or more levels disposed on a first side of said carrier; cross-linking agents; and sensing elements cross-linked to said matrix, wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and functionally interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45). Ershov et al teach a similar platform comprising: a carrier, a matrix and cross-linking agents, said carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-51). Havens et al and Ershov et al teach the aqueous matrix comprises agarose (Havens et al, Column 9, lines 32-36 and Ershov et al, Column 3, lines 40-45) but they do not teach the matrix comprises a specific buffer. However, it was known in the art at the time the claimed invention was made that agarose comprises buffers as taught by Chetverin et al who teach a similar platform comprising a carrier and aqueous matrix wherein the agarose matrix comprises TRIS (Column 16, lines 32-39). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the TRIS buffered agarose as taught by Chetverin et al to the agarose of Havens et al and Ershov et al based on the known buffering properties of TRIS for the obvious benefit of maintaining optimal pH in the agarose to thereby optimize binding reactions between the cross-linked elements and their binding partners.

Regarding Claims 45 and 53, Havens et al teach a platform comprising: a carrier; an aqueous matrix comprising one or more levels disposed on a first side of said carrier; cross-linking agents; and sensing elements cross-linked to said matrix, wherein said carrier is optically inactive (i.e. the PtSi substrate would not transmit or reflect light) and functionally

interacts with the aqueous matrix (Column 7, line 20-Column 8, line 45). Ershov et al teach a similar platform comprising: a carrier, a matrix and cross-linking agents, said carrier having a first side which is hydrophilic and optically inactive (Column 3, lines 17-21 and 40-51) i.e. the carrier is specifically treated with Gammainetacryloxy-propyltrimethoxysilane to provide a hydrophilic surface whereby the matrix is attached to the carrier (Column 3, lines 46-51). Havens et al and Ershov et al teach the aqueous matrix comprises agarose (Havens et al, Column 9, lines 32-36 and Ershov et al, Column 3, lines 40-45) but they do not teach the matrix comprises a humectant. However, it was known in the art at the time the claimed invention was made that matrix comprise humectants as taught by Chetverin et al who teach a similar platform comprising a carrier and aqueous matrix wherein the matrix comprises oil (Column 8, lines 39-45) whereby the oil prevents drying of the aqueous matrix. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the oiled matrix taught by Chetverin et al to the aqueous matrix of Havens et al and Ershov et al to thereby prevent drying of the aqueous matrix for the expected benefit of maintaining the aqueous environment and preventing inactivation of binding reactants as taught by Chetverin et al (Column 8, lines 39-45).

Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. Hahn et al (U.S. Patent No. 6,174,683, B1) teach a biochip comprising a carried, aqueous matrix and sensing elements (Column 4, lines 17-49).

b. Bogart et al (U.S. Patent No. 5,541,057) teach a biochip comprising a carrier, aqueous matrix and sensing elements (Column 2, line 47-Column 3, line 52).

REQUIREMENT TO COMPLY WITH NUCLEIC ACID SEQUENCE RULES

10. This application contains sequence disclosures on page 38 that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825 for the reason(s) set forth on the attached Notice To Comply With Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino Acid Sequence Disclosures. Applicant must comply with the requirements of the sequence rules (37 CFR 1.821 - 1.825) before the application can be examined under 35 U.S.C. §§ 131 and 132.

Applicant is given A PERIOD OF TIME WHICH IS CO-EXTENSIVE WITH THE TIME TO REPLY TO THE ATTACHED OFFICE ACTION within which to comply with the sequence rules, 37 CFR 1.821 - 1.825. Failure to comply with these requirements will result in ABANDONMENT of the application under 37 CFR 1.821(g). Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a). Direct the reply to the undersigned. Applicant is requested to return a copy of the attached Notice to Comply with the reply.

Conclusion

11. No claim is allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

BJ Forman, Ph.D.
Patent Examiner
Art Unit: 1655
February 21, 2002